

Serial No.: «PatentApplicationNumber»
Art Unit: «GroupArtUnit»
Examiner: «PatentExaminer»
Page 6 of

REMARKS

By this amendment, claim 1 has been amended, and claims 8, 31-34 have been canceled. No claims have been added.

Claims 1-7 and 9-30 remain pending. Reconsideration and allowance of the present application are respectfully requested in view of the foregoing amendments and the following remarks.

In the Office Action, the Examiner rejected claims 1-4, 7-16, 18-21, 23-29, and 31-34 under 35 U.S.C. 102(b). They were specifically rejected as being anticipated by Watson (5,829,407).

In the Office Action, the Examiner failed to specify which embodiment of Watson he is referring to for his rejection. Although in his 35 U.S.C. 103(a) rejection he appears to be referring to Fig. 7, there are no indications concerning the 35 U.S.C 102(b) rejection. There are two embodiments that the Applicant believes the Examiner could be referring to. They are the embodiment shown in Figs. 1-4 and the embodiment shown in Fig.7. Although Watson describes Figure 8 as a different embodiment, it only differs from the embodiment of Fig. 7 by the presence of a conduit 81, which is not relevant to the presently claimed invention. Fig. 8 will therefore be treated as being the same embodiment as the embodiment of Fig. 7. Since the Applicant has no clear indication as to which embodiment of Watson the Examiner is referring to, both embodiments will be addressed in the Applicant's remarks.

The embodiment shown in Figs. 1-4 of Watson, which will be referred to as embodiment 1 hereinafter, shows an engine cylinder having a first zone (cavity 35), a second zone (pre-combustion chamber 38), an opening 42 to receive a spark plug, an opening 41 to receive an injector, an inlet valve 44, and an exhaust valve 45. The first zone is "pent-roofed" as seen in Figs. 3 and 4. The second zone is domed (col. 6, ln.42).

The embodiment shown in Fig. 7 of Watson, which will be referred to as embodiment 2 hereinafter, shows an engine cylinder having a cavity 35 having two

Serial No.: «PatentApplicationNumber»

Art Unit: «GroupArtUnit»

Examiner: «PatentExaminer»

Page 7 of

zones. The first zone having an upper wall in which an exhaust port is defined (exhaust valve 45) and a second zone disposed in an upper end of cavity 35 and having a side wall disposed at an angle from the upper wall of the first zone. A pre-combustion chamber 76 is disposed above the second zone and communicates with the second zone via throat 77. The pre-combustion chamber is separate and distinct from the combustion chamber. A spark plug 74 is disposed in a side wall of the pre-combustion chamber, and an injector 78 is disposed at the top of the pre-combustion chamber.

Claim 1 has been amended to now recite, *inter alia*, "an opening formed in the second zone and configured to receive a sparkplug having a tip intersecting the fuel spray projection; and wherein the axis of symmetry of the second zone is skewed and offset from the axis of symmetry of the first zone."

In embodiment 1 of Watson, the axis of symmetry of the second zone is coaxial with the axis of symmetry of the first zone. It is not skewed and offset as claimed by the Applicant. Therefore, embodiment 1 of Watson cannot anticipate claim 1.

In embodiment 2 of Watson, the spark plug is located in an opening formed in the pre-combustion chamber. It is not located in an opening formed in the second zone as is now claimed by the Applicant. Therefore, embodiment 2 of Watson cannot anticipate claim 1. The Applicant would also like to point out that it would not be obvious to move the spark plug of Watson to the second zone since this would be contrary to the teachings of Watson which consist in providing pre-combustion in a pre-combustion chamber, and therefore must require a spark plug in the pre-combustion chamber.

Therefore, in view of the above remarks, it is respectfully submitted that claim 1 should now be allowable.

Dependent claims 2-4, 7, 9, and, 10 recite additional features of the invention and are therefore believed to be allowable for the same reasons discussed above with respect to claim 1 and for the additional features recited therein.

Claim 11 recites, *inter alia*, a combustion chamber having "a lower portion having a cross-sectional shape that is asymmetric about a central axis of the cylinder; and an

Serial No.: «PatentApplicationNumber»

Art Unit: «GroupArtUnit»

Examiner: «PatentExaminer»

Page 8 of

upper portion positioned generally coaxially about a fuel spray pattern and having a first side configured to receive a spark plug therein."

In embodiment 1 of Watson, the lower portion (cavity 35) of the combustion chamber has a cross-sectional shape that is symmetric. It is not asymmetric as claimed by the Applicant. Therefore embodiment 1 of Watson cannot anticipate claim 11.

In embodiment 2 of Watson, the upper portion (the second zone described above) of the combustion chamber is not configured to receive a spark plug in a side thereof. The spark plug is located in a side of the pre-combustion chamber 76. Therefore embodiment 2 of Watson cannot anticipated claim 11. The Applicant would also like to point out that it would not be obvious to move the spark plug of Watson to the upper portion of the combustion chamber for the same reasons discussed above with respect to claim 1.

Therefore, in view of the above remarks, it is respectfully submitted that claim 11 should be allowable.

Dependent claims 12-16 and 18-21 recite additional features of the invention and are therefore believed to be allowable for the same reasons discussed above with respect to claim 11 and for the additional features recited therein.

Claim 23 recites a combustion chamber comprising "a first recess formed in a cylinder head and having an angle of penetration of less than 90 degrees from a horizontal as determined from an intake side of a cylinder; and a second recess interconnected with the first recess and having an angle of penetration greater that 90 degrees from the horizontal as determined from the intake side of the cylinder."

The Examiner appears to base his rejection of claim 23 on the figures alone. Since Watson is silent on the angles of the combustion chamber and says nothing as to whether the drawings are to scale, the drawings cannot be used as evidence of proportions of features in the drawings (MPEP 2125), and therefore cannot be used to anticipate claim 23. Moreover, even if one were to assume that the proportion of

Serial No.: «PatentApplicationNumber»
Art Unit: «GroupArtUnit»
Examiner: «PatentExaminer»
Page 9 of

features in the drawings were to scale, Watson would still not anticipate claim 23 for the reasons set forth below.

Embodiment 1 of Watson has a second recess (the second zone described above) that is domed. The only way to determine an angle of penetration of a dome would be to measure angles of lines tangent to the surface of the dome. All lines tangent to the dome would have an angle of penetration of less than 90 degrees, not greater than 90 degrees as claimed by the applicant. Therefore embodiment 1 of Watson cannot anticipate claim 23 even if one were to take the drawings thereof as being to scale.

Embodiment 2 of Watson, shows two recesses having different angles of penetration. The angles of penetration as claimed by the Applicant are measured from the horizontal as determined from an intake side of the cylinder. Embodiment 2 of Watson does not show an intake, only an exhaust, and for that reason alone cannot anticipate claim 23. However, one may assume that the intake would be on the side opposite to the exhaust. If one were to do that, embodiment 2 of Watson would still not anticipate claim 23 since both angles of penetration as measured from the horizontal as determined from the intake side would be less than 90 degrees.

Therefore, in view of the above remarks, it is respectfully submitted that claim 23 should be allowable.

Dependent claims 24-29 recite additional features of the invention and are therefore believed to be allowable for the same reasons discussed above with respect to claim 23 and for the additional features recited therein.

In the Office Action, the Examiner rejected claims 5, 6, 17, 22, and 30 under 35 U.S.C. 103(a). They were specifically rejected as being unpatentable over Watson (5,829,407).

Dependent claims 5 and 6 recite additional features of the invention and are therefore believed to be allowable for the same reasons discussed above with respect to claim 1 and for the additional features recited therein.

Serial No.: «PatentApplicationNumber»

Art Unit: «GroupArtUnit»

Examiner: «PatentExaminer»

Page 10 of

Dependent claims 17 and 22 recite additional features of the invention and are therefore believed to be allowable for the same reasons discussed above with respect to claim 11 and for the additional features recited therein.

Dependent claim 30 recites additional features of the invention and is therefore believed to be allowable for the same reasons discussed above with respect to claim 23 and for the additional features recited therein.

Also, regarding the rejection of claims 5, 6, 17 and 22, the Applicant disagrees with the Examiner when he mentions that the particular shape of the combustion chamber is an obvious choice of mechanical design. US patent class 123, subclass 657 relates to combustion chamber form and construction and contains many patents where the shape of the combustion chamber was found to be a patentable feature, see for example US 5,941,221. Therefore should the Examiner decide to apply the same rejection again, the Applicant hereby requests that he provides a secondary reference showing the claimed shape as well as a motivation to combine it with the present reference.

In view of the above amendments and remarks, the Applicant respectfully submits that claims 1-7 and 9-30 are allowable and that the entire application is in condition for allowance.

Should the Examiner believe that anything further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



Jonathan D. Cutler, Reg. No. 40,576

Attorney for the Applicant

Tel. (514) 732-7050

Fax (514) 732-7058

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.